Centennial School District
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BID CONDITIONS AND SPECIFICATIONS

DATA CENTER UNINTERRUPTIBLE POWER SUPPLY BID

BID NUMBER 2013-10

Submission Date and Time: January 25, 2013, 1:30 p.m.

Bid Opening Date and Time: January 25, 2013, 1:30 p.m.

Destination for Delivery of Bids:

Centennial School District
Administration Building
Business Office
433 Centennial Road
Warminster, PA18974-5455

CENTENNIAL SCHOOL DISTRICT
Administration Building
Warminster, PA18974-5455

Bid Number 2013-10 DATA CENTER UNINTERRUPTIBLE POWER SUPPLY BID January 2013

The Centennial School District (CSD) is soliciting bids on a project to provide uninterruptible power supply (UPS) units to serve the data center in the District Administration Building. This capability, provided by battery operated unit as specified below, will maintain power in the event of a power outage until the generator located at the building can begin providing replacement power. Therefore, the duration during which time this UPS unit will be providing power is estimated to be 10-15 seconds. The District is asking for respondents to provide installation bid cost. Also, as an option, the District is asking respondents to provide wiring costs from the building's main electrical panel to the Data Center should such wiring upgrade be deemed necessary.

1. Sealed bids for furnishing the Centennial School District with this UPS system shall be in the hands of Mr. Christopher Berdnik, Chief Financial Officer, Administration Building, 433 Centennial Road, Warminster, PA 18974-5455 on or before 1:30 p.m., January 25, 2013 and plainly marked on the envelope "Data Center Uninterruptible Power Supply Bid No. 2013-10".

2. Bids will be opened on January 25, 2013 in the Centennial School District Business Office, Administration Building, 433 Centennial Road, Warminster, PA 18974-5455 beginning at 1:30 p.m.

3. Each bid totaling $10,000 or more must be accompanied by a Certified or Bank Issued Check or Bid Bond, made payable to Centennial School District, in the amount of 10% of the total bid as a guarantee of successful completion of the contract. All checks submitted with bids will be held uncashed and returned to all unsuccessful bidders when bids are awarded.

4. Centennial School Board reserves the right to waive any or all the technicalities in this bid. Bidders will guarantee the bid price will remain firm for 90 days from date of the bid opening.

5. The District reserves the right to increase or decrease quantities.

6. The Centennial School Board reserves the right to accept or reject any or all bids and to determine for itself what shall be acceptable as equals.

7. Failure to complete and return the enclosed Non-Collusion affidavit with your bid will result in disqualification.

8. Bidder agrees to adhere to Anti-Discrimination Clause included within the contents of this bid.

9. Acceptable manufacturer - Liebert® APM™ UPS with the following model numbers:
   UPS - NRB41CCSAHA3C98
   Bypass Distribution Cabinet - NRMB0C4C0RA0H64
   Internal Batteries - HX150-FR

10. Substitutions – In order to maintain compatibility with the District's existing Liebert UPS monitoring system, no substitutions will be accepted.

11. UPS Specifications

11.1. SUMMARY

This specification defines the electrical and mechanical characteristics and requirements for a continuous-duty three-phase, solid-state, scalable (field-upgradable) uninterruptible power system (UPS). The UPS shall provide high-quality AC power for sensitive electronic equipment.

11.2. STANDARDS

The UPS shall be designed in accordance with the applicable sections of the current revision of the following documents. Where a conflict arises between these documents and statements made herein, the statements in this specification shall govern.

11.3. UL Standard 1778

11.4. CSA 22.2, No. 107.3, 4th edition

11.5. FCC Part 15, Class A

11.6. IEC 61000-3-4,4-4,4-2,4-3,4-6,2-2

11.7. National Electrical Code (NFPA-70)

11.8. NEMA PE-1

11.9. ISTA_1H

11.10. ANSI C62.41, Categories A3 and B3

11.11. The UPS shall be UL and cUL listed per UL Standard 1778.

11.12. SYSTEM DESCRIPTION

11.13. Design Requirements - UPS Module

11.14. Voltage. Input/output voltage specifications of the UPS shall be:

11.14.1.1.1. Rectifier Input: 208 volts, three-phase, 4-wire-plus-ground
11.14.1.1.2. Bypass Input: 208 volts, three-phase, 4-wire-plus-ground
11.14.1.1.3. Output: 208 volts, three-phase, 4-wire-plus-ground

11.14.1.2. Output Load Capacity. Specified output load capacity of the UPS shall be scalable from 15-45 kVA at unity power factor.

11.14.1.3. Scalable Output Capacity. UPS rated output capacity will be scalable by Emerson Network Power Liebert Services. Models will be available in two different frames:

11.14.1.3.1. 45kVA Frame - Scalable in 15kVA increments with Liebert FlexPower™ modules: 15, 30 and 45kVA

11.14.2. Design Requirements - Battery

11.14.2.1. Battery Cells: Valve-regulated, lead acid batteries.

11.14.2.2. Reserve Time: 12 minutes at 45 kVA/kW, unity power factor, with ambient temperature of 77°F (25°C). Unit shall provide terminal for connection of external batteries.

11.14.2.3. Recharge Time: to 95% capacity within ten (10) times discharge time.

11.14.3. Modes of Operation

The UPS shall be designed to operate as an on-line, double-conversion, reverse-transfer system with the following operating modes:

11.14.3.1. Normal - The critical AC load is continuously supplied by the UPS inverter. The rectifier/charger derives power from an AC source and supplies DC power to the inverter while simultaneously float-charging the reserve battery.

11.14.3.2. Emergency - Upon failure of utility AC power, the critical AC load is supplied by the inverter, which obtains power from the battery. There shall be no interruption in power to the critical load upon failure or restoration of the utility AC source.

11.14.3.3. Recharge - Upon restoration of utility AC power after a utility AC power outage, the rectifier/charger shall automatically restart, gradually ramp up output voltage and assume the inverter and battery recharge loads.

11.14.3.4. Bypass - If the UPS must be taken out of service for maintenance or repair or if the inverter overload capacity is exceeded, the static transfer switch shall perform a reverse transfer of the load from the inverter to the bypass source with no interruption in power to the critical AC load.

11.14.4. Performance Requirements

11.14.4.1. AC Input to UPS

11.14.4.1.1. Voltage Configuration for Standard Units: 208V, three-phase, four-wire plus ground

11.14.4.1.2. Voltage Range: +15%, -20% of nominal without derating

11.14.4.1.3. Frequency: 40-70Hz

11.14.4.1.4. Power Factor: 0.99 full load, 0.98 half load

11.14.4.1.5. Inrush Current: UPS inrush current not to exceed 1.5 times rated input current. Maintenance bypass and distribution cabinet inrush current not to exceed 8 times rated input current.

11.14.4.1.6. Current Limit: 140% of nominal AC input current maximum

11.14.4.1.7. Current Distortion: <3% reflected THD maximum at full load

11.14.4.1.8. Surge Protection: Sustains input surges without damage per criteria listed in IEC 1000-4-5

11.14.5. AC Output, UPS Inverter

11.14.5.1. Voltage Configuration: three-phase, 4-wire plus ground

11.14.5.2. Voltage Regulation:

11.14.5.3. ±1% three-phase RMS average for a balanced three-phase load for the combined variation effects of input voltage, connected load, battery voltage, ambient temperature and load power factor

11.14.5.4. ±5% three-phase RMS average for a 100% unbalanced load for the combined variation effects of input voltage, connected load, battery voltage, ambient temperature and load power factor

11.14.5.5. Frequency: ±0.1% (single Liebert FlexPower assembly)
±0.25% (six Liebert FlexPower assemblies)

11.14.5.6. Frequency Slew Rate: Selectable from 0.1Hz/sec to 3.0Hz/sec maximum for single unit

11.14.5.7. Phase Balance: 120 degrees ±1 degree for balanced load
120 degrees ±1.5 degrees for 100% unbalanced load

11.14.5.8. Voltage Distortion: <1% total harmonic distortion (THD) for linear loads
<5% THD for 100% nonlinear loads (3:1 crest factor) without kVA/kW derating

11.14.5.9. Load Power Factor Range: 0.7 lagging to 0.9 leading without derating

11.14.5.10. Output Power Rating: 0.99 full load. 0.98 half load

11.14.5.11.Overload Capability:
110% for 60 minutes
125% for 10 minutes
150% for 60 seconds

11.14.5.12. Voltage Transient Response: 100% load step, ±5.0%

11.14.5.13. Transient Recovery Time: to within 5% of steady state output voltage within half a cycle

11.14.5.14. Voltage Unbalance: 100% unbalanced load, ±5%

11.15. ENVIRONMENTAL CONDITIONS

The UPS shall be able to withstand the following environmental conditions without damage or degradation of operating characteristics:

11.15.1. Operating Ambient Temperature

11.15.1.1. UPS Module: 32°F to 104°F (0°C to 40°C)

11.15.1.2. Battery: 77°F ±9°F (25°C ±5°C)

11.15.2. Storage/Transport Ambient Temperature

11.15.2.1. UPS Module: -4°F to 158°F (-20°C to 70°C)

11.15.2.2. Battery: -4°F to 86°F (-20°C to 30°C)

11.15.3. Relative Humidity- 0 to 95%, non-condensing

11.15.4. Altitude

11.15.4.1. Operating: 3300 ft. (1000m) above sea level; derate power by 1% per 330 ft. between 3300 and 6000 ft.

11.15.4.2. Storage/Transport: to 40,000 ft. above mean sea level.

11.15.5. Audible Noise - 56 dB (45kW/kVA model)

12. SUBMITTALS

12.1. Proposal Submittals - Submittals with the proposal shall include:

12.1.1. DATA CENTER UNINTERRUPTIBLE POWER SUPPLY BID – PRICING SHEET – (Pg. 18)

12.2. Upon the award of a purchase order, the successful bidder will submit with five (5) business days:

12.2.1. System configuration with single-line diagrams

12.2.2. Functional relationship of equipment including weights, dimensions and heat dissipation

12.2.3. Descriptions of equipment to be furnished, including deviations from these specifications

12.2.4. Size and weight of shipping units to be handled by installing contractor

12.2.5. Detailed layouts of customer power and control connections

12.2.6. Detailed installation drawings including all terminal locations

12.2.7. One (1) set of instruction manuals that shall include a functional description of the equipment with block diagrams, safety precautions, instructions, step-by-step operating procedures and routine maintenance guidelines, including illustrations.

13. WARRANTY

The UPS manufacturer shall warrant the UPS against defects in materials and workmanship for one (1) year. The no-hassle replacement warranty shall include shipping to and from the customer site. All battery replacements are covered within the 1 year warranty period.

14. QUALITY ASSURANCE

14.1. Manufacturer Qualifications

A minimum of 20 years' experience in the design, manufacture and testing of solid-state UPS systems is required. The system shall be designed and manufactured according to world-class quality standards. The manufacturer shall be ISO 9001:2000 certified.

14.2. Factory Testing

Before shipment, the manufacturer shall fully and completely test the system to assure compliance with the specification.

15. PRODUCT

15.1. FABRICATION

15.1.1. Materials

All materials of the UPS shall be new, of current manufacture and high grade and shall not have been in prior service except as required during factory testing. All active electronic devices shall be solid-state. All power semi-conductors shall be sealed. Control logic and fuses shall be physically isolated from power train components to ensure operator safety and protection from heat. All

electronic components shall be accessible from the front without removing sub-assemblies for service access.

15.1.2. Wiring

Wiring practices, materials and coding shall be in accordance with the requirements of the National Electrical Code, OSHA and applicable local codes and standards. All bolted connections of busbars, lugs and cables shall be in accordance with requirements of the National Electrical Code and other applicable standards. All electrical power connections shall be torqued to the required value and marked with a visual indicator.

Provisions shall be made in the cabinets to permit installation of input, output and external control cabling, using raceway or conduit. Provision shall be made for top and bottom access to input, output, bypass and DC connections. In conformance with NEC, connection cabinets shall provide for adequate wire bend radius. All copper busbars for customer power connections shall be tin plated for connection integrity.

15.1.3. Construction and Mounting

The UPS shall be in NEMA Type 1 enclosures, designed for floor mounting. The UPS shall be structurally adequate and have provisions for hoisting, jacking and forklift handling. Maximum cabinet height shall be 78.7 in.

15.1.4. Cooling

Cooling of the UPS shall be by forced air using a redundant fan configuration. Fan power shall be provided by the UPS. The Liebert APM UPS requires 12 inches (305mm) rear clearance for air flow, and the following requirements for top clearance air flow:

15.1.4.1. 45kVA UPS with either top or bottom cable entry: 12" (305mm) clearance unless UPS Fan kit accompanies the system providing mounting flush to the wall.

The thermal design, along with all thermal and ambient sensors, shall be coordinated with the protective devices before excessive component or internal cabinet temperatures are exceeded. Air filters shall be located at the point of air inlet and be changeable.

Access shall be:

15.1.4.2. Liebert APM UPS and Battery Storage Cabinet: Front access

15.1.4.3. Liebert APM maintenance bypass cabinet: Front access only

15.2. COMPONENTS

15.2.1. Rectifier/Charger

15.2.1.1. General

The term rectifier/charger shall denote the solid-state equipment and controls necessary to convert AC to regulated DC for input to the inverter and for charging the battery.

15.2.1.2. AC Input Current Limiting

The rectifier/charger unit shall be provided with AC input current limiting whereby the maximum input current shall be limited to 140% of the full input current rating.

15.2.1.3. DC Filter

The rectifier/charger shall have an output filter to minimize ripple current into the battery.

The AC ripple voltage of the rectifier DC output shall not exceed 1% RMS of the float voltage. The filter shall be adequate to ensure that the DC output of the rectifier/charger will meet the input requirements of the inverter without the battery connected.

15.2.1.4. Automatic Rectifier Restart
Upon restoration of utility AC power, after a utility AC power outage and prior to a UPS automatic end-of-discharge shutdown, the rectifier/charger shall automatically restart, walk-in and gradually assume the inverter and battery recharge loads.

15.2.1.5. Battery Recharge
In addition to supplying power for the inverter load, the rectifier/charger shall be capable of producing battery charging current sufficient to replace 95% of the battery discharge power within ten (10) times the discharge time. After the battery is recharged, the rectifier/charger shall maintain the battery at full charge until the next emergency operation.

15.2.1.6. Overvoltage Protection
There shall be DC overvoltage protection so that if the DC voltage rises to the preset limit, the UPS will shut down automatically and initiate an uninterrupted load transfer to the static bypass line.

15.2.2. Inverter

15.2.2.1. General
The term inverter shall denote the equipment and controls to convert DC from the rectifier/charger or battery to precise AC to power the load. The inverter shall be solid-state, capable of providing rated output power, and for increased performance the inverter shall be a pulse-width-modulated design and utilize insulated gate bipolar transistors (IGBTs).

15.2.2.2. Overload Capability
The inverter shall be capable of supplying current and voltage for overloads exceeding 100%. The inverter is to provide 150% of full load for 60 seconds, 125% of full load for 10 minutes and 110% of full load for 60 minutes.

A status indicator and audible alarm shall indicate overload operation. The UPS shall transfer the load to bypass when overload capacity is exceeded.

15.2.2.3. Fault Clearing and Current Limit
The inverter shall be capable of supplying an overload current of 150% of its full-load rating for one minute. For greater currents or longer time duration, the inverter shall have electronic current-limiting protection to prevent damage to components. The critical load will be transferred to the static bypass automatically and uninterrupted. The inverter shall be self-protecting against any magnitude of connected output overload. Inverter control logic shall sense and disconnect the inverter from the critical AC load without the requirement to clear protective fuses.

15.2.2.4. Step Load Response

15.2.2.5. Voltage Distortion
Total harmonic distortion in the output voltage will not exceed 1% for 0% to 100% linear loads.
Total harmonic distortion in the output voltage will not exceed 4% for 0% to 100% non-

linear loads.
Total harmonic distortion in the output voltage will not exceed 5% for 0% to 100% non-linear, unbalanced loads.

15.2.2.6. Phase Balance
Electronic controls shall be provided to regulate each phase so that an unbalanced loading will not cause the output voltage to go outside the specified voltage unbalance or phase displacement. With 100% load on one phase (and 0% load on the other two phases) or 100% load on two phases (and 0% load on the other phase), the voltage balance is to be within 5% and the phase displacement is to be 120 degrees within a range of ±1.5 degrees.

15.2.2.7. Inverter Shutdown
For rapid removal of the inverter from the critical load, the inverter control electronics shall instantaneously turn off the inverter transistors. Simultaneously, the static transfer switch shall be turned on to maintain continuous power to the critical load.

15.2.2.8. Inverter DC Protection
The inverter shall be protected by the following disconnect levels:

15.2.2.8.1. DC Overvoltage Shutdown
15.2.2.8.2. DC Undervoltage Warning (Low Battery Reserve)—pre-warning time is adjustable
15.2.2.8.3. DC Undervoltage Shutdown (End of Discharge)

15.2.2.9. Output Frequency
The output frequency of the inverter shall be controlled by a high-speed DSP capable of holding the inverter output frequency to within ±0.1% for a single Liebert FlexPower assembly or ±0.25% for six Liebert FlexPower assemblies during steady state and transient conditions. Total deviation from the rated frequency, including short time fluctuations and drift, shall not exceed 0.1% for a single Liebert FlexPower assembly or 0.25% for six Liebert FlexPower assemblies.

15.2.3. Display and Controls

15.2.3.1. Monitoring and Control
The UPS shall be provided with a microprocessor-based unit status display and controls section designed for convenient and reliable user operation. A graphical liquid crystal display (LCD) shall be used to show a single-line diagram of the UPS and shall be provided as part of the monitoring and controls sections of the UPS. All operator controls and monitors shall be located on the front of the UPS cabinet. Monitoring functions such as metering, status and alarms shall be displayed on the graphical LCD. Additional features of the monitoring system shall include:

15.2.3.1.1. Menu-driven display with pushbutton navigation
15.2.3.1.2. Real-time clock (time and date)
15.2.3.1.3. Alarm history with time and date stamp
15.2.3.1.4. Memory with battery backup

15.2.3.2. Metering
The following parameters shall be displayed:

15.2.3.2.1. Input AC voltage line-to-line
15.2.3.2.2. Input AC current for each phase

15.2.3.2.3. Input frequency
15.2.3.2.4. Battery voltage
15.2.3.2.5. Battery charge/discharge current
15.2.3.2.6. Output AC voltage line-to-line
15.2.3.2.7. Output AC current for each phase
15.2.3.2.8. Output frequency
15.2.3.2.9. Apparent power
15.2.3.2.10. Active power
15.2.3.2.11. Battery time left during battery operation

15.2.3.3. Alarm Messages

The following alarm messages shall be displayed on the home screen:

15.2.3.3.1. Mains Voltage Abnormal
15.2.3.3.2. Mains Undervoltage
15.2.3.3.3. Mains Freq. Abnormal
15.2.3.3.4. Charger Fault
15.2.3.3.5. Battery Reversed
15.2.3.3.6. No Battery
15.2.3.3.7. Control Power 1 Fail
15.2.3.3.8. Parallel Comm. Fail
15.2.3.3.9. Bypass Unable To Track
15.2.3.3.10. Bypass Abnormal
15.2.3.3.11. Inverter Asynchronous
15.2.3.3.12. Fan Fault
15.2.3.3.13. Control Power 2 Fail
15.2.3.3.14. Unit Over Load
15.2.3.3.15. System Over Load
15.2.3.3.16. Bypass Phase Reversed
15.2.3.3.17. Transfer Time-Out
15.2.3.3.18. Load Sharing Fault
15.2.3.3.19. Bypass Over Current
15.2.3.3.20. Output Ground Fault

15.2.3.4. Status Messages

The following UPS status messages shall be displayed locally:

15.2.3.4.1. Rectifier (Off / Soft Start / Main Input On / Battery Input On)
15.2.3.4.2. Input Supply (Normal Mode / Battery Mode / All Off)
15.2.3.4.3. Battery Self Test (True / False)
15.2.3.4.4. Input Disconnect (Open / Closed)
15.2.3.4.5. EPO (True / False)
15.2.3.4.6. Charger (On / Off)
15.2.3.4.7. Output Disconnect (Open / Closed)
15.2.3.4.8. Maint. Disconnect (Open / Closed)
15.2.3.4.9. Bypass Disconnect (Open / Closed)
15.2.3.4.10. Inverter (Off / Soft Start / On)
15.2.3.4.11. Bypass (Normal / Unable To Trace / Abnormal)
15.2.3.4.12. Output Supply (All Off / Bypass Mode / Inverter Mode / Output Disable)
15.2.3.4.13. Inverter On (Enable / Disable)

15.2.3.5. Controls

UPS startup, shutdown and static bypass operations shall be accomplished through pushbutton controls on the front panel. Menu-driven user prompts shall be provided to

guide the operator through system operation without the use of additional manuals. Pushbuttons shall be provided to display the status of the UPS and to test and reset visual and audible alarms. A mimic screen shall be available on the LCD to depict a single-line diagram of the UPS with switch positions and power flow.

15.2.3.6. On-Line Battery Test

The UPS shall be provided with a menu-driven On-Line Battery Test feature. The test shall ensure the capability of the battery to supply power to the inverter while the load is supplied power in the normal mode.

15.2.4. Static Transfer Switch

15.2.4.1. General

A static transfer switch and bypass circuit shall be provided as an integral part of the UPS. The static switch shall be a naturally commutated high-speed static (SCR-type) device rated to conduct full load current continuously. The switch shall have an overload rating to clear a 20-ampere load branch circuit breaker.

The static transfer switch control logic shall contain an automatic transfer control circuit that senses the status of the inverter logic signals and operating and alarm conditions. This control circuit shall provide an uninterrupted transfer of the load to an alternate bypass source without exceeding the transient limits specified herein, when an overload or malfunction occurs within the UPS or to bypass the UPS for maintenance.

15.2.4.2. Uninterrupted Transfer

The transfer control logic shall automatically turn on the static transfer switch, transferring the critical AC load to the bypass source, after the transfer logic senses any of the following conditions:

15.2.4.2.1. Inverter overload capacity exceeded
15.2.4.2.2. Critical AC load overvoltage or undervoltage
15.2.4.2.3. UPS fault condition

The transfer control logic shall inhibit an automatic transfer of the critical load to the bypass source if any of the following conditions are present:

15.2.4.2.4. Bypass frequency out of limits
15.2.4.2.5. Bypass out-of-synchronization range with inverter output

15.2.4.3. Uninterrupted Retransfer

Retransfer of the critical AC load from the bypass source to the inverter output shall be automatically initiated unless inhibited by manual control. The transfer control logic shall inhibit an automatic retransfer of the critical load to the inverter if one of the following conditions exists:

15.2.4.3.1. Bypass out of synchronization range with inverter output
15.2.4.3.2. Inverter/bypass voltage difference exceeding preset limits
15.2.4.3.3. Overload condition exists in excess of inverter full load rating
15.2.4.3.4. UPS fault condition present

15.2.4.4. Battery Power Pack

The battery power pack shall include valve-regulated, lead-acid battery cells housed in a separate cabinet that matches the UPS cabinet styling to form an integral system lineup.

Battery cells shall be mounted on slide-out trays for ease of maintenance. A battery disconnect circuit breaker shall be included for isolation of the battery pack from the UPS module. Casters and leveling feet shall also be provided with the battery power pack cabinet for ease of installation. When the application calls for the battery cabinet to be bolted to the UPS cabinet, an interconnecting cable kit will be available, precut and pre-lugged.

15.2.5. Required Accessories

15.2.5.1. Liebert IntelliSlot® Web Card (ISWEB-L)
Provides communication outputs to indicate a change of status of the UPS. Outputs are provided for:

15.2.5.1.1. SNMP
15.2.5.1.2. HTML - Web page
15.2.5.1.3. Allow use of Liebert Nform™ and or network management systems

SNMP protocol shall provide remote communications to Liebert Nform with the following messages:

15.2.5.1.4. Mains Voltage Abnormal
15.2.5.1.5. Mains Undervoltage
15.2.5.1.6. Mains Freq. Abnormal
15.2.5.1.7. Charger Fault
15.2.5.1.8. Battery Reversed
15.2.5.1.9. No Battery
15.2.5.1.10. Control Power 1 Fail
15.2.5.1.11. Parallel Comm. Fail
15.2.5.1.12. Bypass Unable To Track
15.2.5.1.13. Bypass Abnormal
15.2.5.1.14. Inverter Asynchronous
15.2.5.1.15. Fan Fault
15.2.5.1.16. Control Power 2 Fail
15.2.5.1.17. Unit Over Load
15.2.5.1.18. System Over Load
15.2.5.1.19. Bypass Phase Reversed
15.2.5.1.20. Transfer Time-Out
15.2.5.1.21. Load Sharing Fault
15.2.5.1.22. Bypass Over Current
15.2.5.1.23. Output Ground Fault

15.2.5.2. Matching Maintenance Bypass and Distribution Cabinet
A make-before-break maintenance bypass with Solenoid Key Release Unit (SKRU) interlock shall be available in a cabinet that matches and may be bolted up to the right side of the UPS. Installation of the cabinet shall not affect the cooling ability of the UPS. Thermal-magnetic breakers shall be provided for bypass and maintenance isolation.

16. EXECUTION

16.1. FIELD QUALITY CONTROL
The following inspections and test procedures shall be performed by factory-trained field service personnel during the UPS startup.

16.1.1. Visual Inspection

16.1.1.1. Inspect equipment for signs of damage.
16.1.1.2. Verify installation per drawings.
16.1.1.3. Inspect cabinets for foreign objects.
16.1.1.4. Verify neutral and ground conductors are properly sized and configured.
16.1.1.5. Inspect battery cases.
16.1.1.6. Inspect battery for proper polarity.
16.1.1.7. Verify all printed circuit boards are configured properly.

16.1.2. Mechanical Inspection

16.1.2.1. Check all control wiring connections for tightness.
16.1.2.2. Check all power wiring connections for tightness.
16.1.2.3. Check all terminal screws, nuts and/or spade lugs for tightness.

16.1.3. Electrical Inspection

16.1.3.1. Check all fuses for continuity.
16.1.3.2. Confirm input voltage and phase rotation is correct.
16.1.3.3. Assure connection and voltage of the battery string(s).

16.1.4. Preventive Maintenance

16.1.4.1. Startup shall include one preventive maintenance visit during the first year scheduled at customer’s convenience. The PM will include the following services for one UPS module: consult with personnel responsible for the equipment, visually inspect internal sub-assemblies and major components, check all mechanical connections for tightness and heat discolorations, clean any foreign material and dust from internal compartments, check status of all alarm circuits, calibrate equipment to manufacturer's specifications, check the normal operation of the system, check battery transfer/discharge and perform a short duration battery run, perform any required engineering field changes, return unit to operational service with normal load then verify the output.
16.1.4.2. See section 16.2.3 for detailed scope.

16.2. MANUFACTURER’S FIELD SERVICE

16.2.1. Service Personnel

The UPS manufacturer shall directly employ a nationwide service organization consisting of factory-trained field service personnel dedicated to the startup and maintenance of UPS and power equipment.

The manufacturer shall provide a national dispatch center to coordinate field service personnel schedules. One toll-free number shall reach a qualified support person 24 hours/day, 7 days/week, 365 days/year. If emergency service is required, on-site response time shall be four hours or less within 150 miles of a Liebert Services center.

Two local customer engineers shall be assigned to the site with a regional office as a backup. Escalation procedures shall be in place to notify Power Technical Support if a site is not functioning within 24 hours.

16.2.2. Replacement Parts Stocking

Parts shall be available through an extensive network to ensure round-the-clock parts availability

throughout the country.

Spare parts shall be stocked by local field service personnel with backup available from national parts center and the manufacturing location. A national parts center Customer Support Parts Coordinator shall be on call 24 hours a day, 7 days a week, 365 days a year for immediate parts availability.

16.2.3. Maintenance Contracts

Vendor shall provide service contract following the expiration of the UPS warranty for years 2-5. Contract shall cover the UPS, Internal Batteries, and Maintenance bypass with the following service and scope:

16.2.3.1. UPS Service Contract Scope:
16.2.3.2. Guaranteed 4-hour on-site emergency response, 7 days/week, 24 hours/day, within 150 miles of Manufacturer Services' Service city.
16.2.3.3. Includes 100% parts coverage (excluding air filters and proactive full bank capacitor replacement).
16.2.3.4. Internal Battery Coverage - Includes parts, labor and battery jars as required - up to 10% of the battery string per year (not accumulated over contract term).
16.2.3.5. Includes 100% labor and travel coverage 7 days/week, 24 hours/day.
16.2.3.6. Performed by Level I Liebert factory trained Customer Engineers.
16.2.3.7. Includes battery recycling as required, with documentation meeting EPA requirements.
16.2.3.8. Includes one Annual Preventive Maintenance Service and one Semi-Annual Preventive Maintenance Service visit on the UPS and internal battery cabinet scheduled by the customer between 8am-5pm, Monday-Friday (excluding national holidays).
16.2.3.9. Includes 1-800-LIEBERT Customer Response Center.
16.2.3.10. Includes access to Liebert Customer Services Network On-Line Internet portal.
16.2.3.11. Subject to all Terms & Conditions as noted in the Liebert Services Terms & Conditions.

16.2.4. UPS Preventive Maintenance

UPS Preventive Maintenance shall be performed annually and semiannually Monday thru Friday between 8AM and 5PM with the following scope:

16.2.4.1. UPS Annual and Semi-Annual Preventive Maintenance Services Include:
16.2.4.1.1. Perform a temperature check on all breakers, connections and associated controls. Repair and/or report all high temperature areas.
16.2.4.1.2. Perform a complete visual inspection of the equipment, including sub-assemblies, wiring harnesses, contacts, cables and major components.
16.2.4.1.3. Inspect for broken, brittle, damaged, or heat stressed components and cables.
16.2.4.1.4. Clean any foreign material and dust from internal compartments.
16.2.4.1.5. Perform a status check of alarm circuits.
16.2.4.1.6. Install or perform Engineering Field Modifications including firmware revisions as necessary.
16.2.4.1.7. Return the system to normal load and verify the output voltage.
16.2.4.1.8. Review system performance with customer to address any system questions.
16.2.4.1.9. Record phase to phase input voltages from display *
16.2.4.1.10. Check all nuts, bolts, screws, and connections for heat discoloration.*
16.2.4.1.11. Perform an operational test of the system including unit transfer to and from bypass.*
16.2.4.1.12. Perform an operational test of the system including unit transfer to and from battery.*

*Service Performed Annually Only

16.2.4.2. UPS Internal Battery Semi-Annual Service

16.2.4.2.1. Inspect the appearance and cleanliness of the battery and the battery room. Clean normal cell top dirt accumulation (to be done only with battery off line).
16.2.4.2.2. Measure and record the total battery float voltage and charging current.
16.2.4.2.3. Measure and record the overall AC ripple current.
16.2.4.2.4. Measure and record the overall AC ripple voltage.
16.2.4.2.5. Visually inspect the jars and covers for cracks and leakage.
16.2.4.2.6. Visually inspect for evidence of corrosion.
16.2.4.2.7. Measure and record the ambient temperature.
16.2.4.2.8. Verify the condition of the ventilation equipment, if applicable.
16.2.4.2.9. Verify the integrity of the battery rack/cabinet.
16.2.4.2.10. Measure and record 100% of the cell temperatures.
16.2.4.2.11. Measure and record the float voltage of all cells.
16.2.4.2.12. Measure and record all internal impedance readings.
16.2.4.2.13. Provide a detailed written report noting any deficiencies and corrective action needed, taken and/or planned.
16.2.4.2.14. Re-tighten all battery connections to the battery manufacturer's specifications, offline only.*

*Service performed Annually Only

16.2.4.3. Corrective Battery Maintenance Performed as Required

16.2.4.3.1. Refurbish cell connections as deemed necessary by the detailed inspection report.

17. Optional Rack Power distribution

17.1. SUMMARY

Liebert MPH Managed Rack PDU power system, hereafter referred to as the Liebert MPH, delivers power distribution, monitoring and receptacle control to plug/cord connected IT devices and sensitive electronic equipment loads.

17.2. STANDARDS

Liebert MPH is designed in accordance with the applicable sections of the current revision of the following documents. Where a conflict arises between these documents and statements made herein, the statements in this specification will govern.

17.3. North America

17.3.1.1. 120V & 208V Single Phase and 3 phase Units

17.3.1.1.1. UL 60950-1 Information Technology Equipment
17.3.1.1.2. CAN/CSA-C22.2 No. 60950-1-03 Information Technology Equipment
17.3.1.1.3. FCC, Title 47, Part 15 Subpart B for Class B operation as defined by ANSI Standard C63.4
17.3.1.1.4. ROHS Compliant
17.3.1.1.5. ISTA Procedure 1A and 2A

17.4. System Description

Liebert MPH Rack PDU's, with remote monitoring and/or control capabilities for power distribution at the load/equipment level, are designed to support the growth in rack electrical needs while meeting the new demands for remote power management. These products are a part of the Rack PDU's from Emerson Network Power - a family of rack power distribution systems designed to manage power from the UPS all the way to each individual receptacle.

Liebert MPH monitors electrical attributes of an individual Rack PDU, including real-time remote and (optional) local display of monitoring of aggregate and branch electrical parameters (status, thresholds, alarms) including voltage, amps, kW, and kW-hr. Liebert MPH features include: Rack PDU and Branch load monitoring and control for continuous uptime and minimum disruptions; Expandable monitoring interface providing simplified growth management; rugged construction; offered factory installed in the Knurr rack enclosure system.

All Rack PDU's include a 10ft. (3meter) input power cord with appropriate input plug connection and overload protection from a Hydraulic-Magnetic 20 amp branch breaker ; basic tool-less rack mounting provisions are also provided for Emerson Network Power Knurr racks. Liebert MPH Managed Rack PDU's are available in rack-mount and vertical zero-U form factors and are painted black.

17.4.1. Vertical-Mount Dimensions:
68.1" (1730 mm) H x 1.9" (50 mm) W x 3.1" (80 mm) D

17.4.2. Rack-Mount Dimensions:
1.7" (44 mm) H x 17.2" (438 mm) W x 7.0 (178 mm) D

17.5. Liebert MPH Managed Rack PDU's

17.5.1. Liebert MPH – Managed Rack PDU (Branch Monitoring Only)
Liebert MPH-NB series power strips provide local and remote monitoring of individual PDU volts, amps, watts, and kilowatt-hours.

17.5.2. Liebert MPH – Managed Rack PDU's – ALL Systems
All Liebert MPH systems are provided with factory integrated Liebert Rack PDU Card (RPC-1000) that provides web based remote monitoring via a direct IP network connection, Rack PDU Array interface connection to three additional Liebert MPH or Liebert MPX systems to allow viewing of up to four Rack PDU's on a single IP connection, an environmental sensor port, and a port for connection to the optional local display. Local display monitoring is provided via the optional Basic Display Module (Liebert RPC-BDM). Each Liebert MPH Unit is provided with basic rack mounting provisions to meet a range of installation needs.

17.5.3. North American Input / Output Systems

17.5.3.1. 120VAC-Single Phase Input / Output – Rack-mount Form Factor

17.5.3.1.1. 9 outlet / 20 or 30 Amp includes 5-20R (T-blade) receptacles; L5-20P or L5-30P plug connection, 3.0 m / 10 foot input power cord, and is 1U tall.

17.5.3.2. 120VAC-Single Phase Input / Output – Vertical Form Factor

17.5.3.2.1. 27 outlet / 20 or 30 Amp includes 5-20R (T-blade) receptacles; L5-20P, or L5-30P plug connection, 3.0m / 10 foot input power cord, and is 1735mm / 68.25 in. long.

17.5.3.3. 200-240VAC-Single Phase Input / Output – Rack-mount Form Factor

17.5.3.3.1. 9 outlet / 20 or 30 Amp includes IEC-C13 receptacles; L6-20P or L6-30P plug connection, 3.0m / 10 foot input power cord, and is 1U tall.

17.5.3.4. 200-240VAC-Single Phase Input / Output – Vertical Form Factor

17.5.3.4.1. 27 or 21 + 6 outlet / 20 or 30 Amp includes twenty-seven IEC-C13 or twenty-one IEC-C13 plus six IEC-C19 receptacles; L6-20P or L6-30P plug connection, 3.0m / 10

foot input power cord, and is 1735mm / 68.25 in. long.

17.5.3.5. 120/208VAC-Three Phase Input / 208 & 120VAC Output – Vertical Form Factor

17.5.3.5.1. 27 or 21 + 6 outlet / 30 Amp includes twenty-seven IEC-C13 or twenty-one IEC-C13 plus six IEC-C19 receptacles; L21-30P plug connection, 3.0m / 10 foot input power cord, and is 1735mm / 68.25 in. long.

17.6. ENVIRONMENTAL CONDITIONS

17.6.1. Ambient Temperature

17.6.1.1. Operating: 32°F ─ 131°F (0°C ─ 55°C) for altitudes 10,000 ft (3000 meters) above sea level.
17.6.1.2. Storage: -4°F ─ 140°F (-20°C ─ 60°C)

17.6.2. Relative Humidity

17.6.2.1. 0 ─ 95% non-condensing, non-corrosive

17.6.3. C. Altitude:

17.6.3.1. 10,000 m (3,000 m max.), without power derating when operated within the temperature specified in section 1.4.A. Ambient temperature will be derated 5°C for each additional 500 m (1640 ft.)

17.6.4. Electrostatic Discharge

17.6.4.1. The 120/230 VAC units are able to withstand an electrostatic discharge compliant to EN61000-4-2, level 3, Criteria A , without damage and without affecting the connected load.

17.7. USER Accessories and Packaging

Liebert MPH system is supplied with (1) user's manual. The manual includes installation drawings and instructions, a functional description of the equipment, safety precautions, illustrations, and operating procedures. The package meets the requirements of ISTA Procedure 1A and 2A.

17.8. WARRANTY

The manufacturer warrants the MPH against defects in materials and workmanship for five (5) years. Specific terms are defined by Emerson Network Power

18. UPS INSTALLATION

18.1. INSTALLATION SCOPE OF WORK

18.1.1. ***Option:*** Provide and install (1) 350MCM Type MC feeder cable from boiler room to Data Center through utility tunnel.
18.1.2. ***Option:*** Provide and install surface mounted EMT conduit for feeder in boiler room and Data Center.
18.1.3. Existing OCP devices to be re-used.
18.1.4. Take delivery of and install UPS equipment, provided by Manufacturer.
18.1.5. Remove existing MDF panel board, install junction box.
18.1.6. Provide and install surface conduit from UPS to new junction box, cut-over branch circuits.
18.1.7. UPS and branch circuit cut-over to be performed during off-hours.

18.1.8. Disconnect existing UPS, remove existing feeder.
18.1.9. UPS removal by others.

18.2. INSTALLATION CLAIRIFICATIONS

18.2.1. Final design is subject to the Authority Having Jurisdiction (AHJ) and is subject to change.
18.2.2. Permit and inspection fees are not included.
18.2.3. Demolition has not been included unless indicated above.
18.2.4. Excavation of rock has not been included.
18.2.5. Prevailing labor rates have not been included.
18.2.6. Cutting, patching and painting have not been included in the proposal.
18.2.7. The cost of bonding has not been included in this proposal.
18.2.8. This proposal is part of the agreement and takes precedence over all other information.
18.2.9. The pricing in this proposal is valid as long as the contract is fully executed within 30 calendar days of the proposal date.
18.2.10. All work will be performed during normal business hours, Monday through Friday
18.2.11. This proposal and all subsequent agreements are governed by the installers Standard Terms & Conditions, a copy is available.

18.3. INSTALLATION WARRANTY

18.3.1. The warranty is for one year from the date of substantial completion.
18.3.2. The warranty is governed by Installers Standard Terms & Conditions.
18.3.3. There is no charge for warranty work during normal business days and hours. A charge will be made for the premium cost of after hour warranty work.

19. If there are any questions concerning item description, quantity or other aspects of these specifications, please call Bob Reed at (215) 441-6000, ext. 11051.

20. Bidder should provide at least five installation references of comparable systems. K-12 references located in southeastern Pennsylvania are preferred. References should include institution name, address, contact name, and telephone number.

21. Please provide one original on paper, one paper copy, and an electronic copy of your proposal.

22. Please check the Legal Notices page on Centennial School District's website, www.centennialsd.org, for addenda prior to submitting your bid.

DATA CENTER UNINTERRUPTIBLE POWER SUPPLY BID – PRICING SHEET

Bid Number 2013-10

Centennial School District
Business Office, Administration Building
433 Centennial Road
Warminster, PA18974-5455

January 25, 2013

We propose to furnish a Liebert System–45 kVA APM UPS as per the specifications contained in the above referenced Bid:

Equipment:

- Liebert System–45 kVA APM UPSw/1 year warranty and 4 year service contract (including the battery), Liebert IntelliSlot® Web Card (ISWEB-L), and Matching Maintenance Bypass and Distribution Cabinet: Total #1 $_____

Installation:

- Installation of all components listed under "Equipment": Total #2 $_____

Credit for Existing UPS:

- Existing UPS is to be picked up by the successful bidder. Total #3 $_____

Options

- 18.1.1 ***Option:*** Provide and install (1) 350MCM Type MC feeder cable from boiler room to Data Center through utility tunnel. $_____

- 18.1.2 ***Option:*** Provide and install surface mounted EMT conduit for feeder in boiler room and Data Center.$_____

- ***Optional Power Distribution Equipment (Quantity to be determined):***
  - **120VAC-Single Phase Input / Output – Rack-mount Form Factor**

  9 outlet / 20 or 30 Amp includes 5-20R (T-blade) receptacles; L5-20P or L5-30P plug connection, 3.0 m / 10 foot input power cord, and is 1U tall.
    - **MPH-NBR09AXXC30 Unit Cost $_____**
    - **MPH-NBR09AXXD30 Unit Cost $_____**

  - **120VAC-Single Phase Input / Output – Vertical Form Factor**

  27 outlet / 20 or 30 Amp includes 5-20R (T-blade) receptacles; L5-20P, or L5-30P plug connection, 3.0m / 10 foot input power cord, and is 1735mm / 68.25 in. long.
    - **MPH-NBV27AXXC30 Unit Cost $_____**
    - **MPH-NBV27AXXD30 Unit Cost $_____**

  - **200-240VAC-Single Phase Input / Output – Rack-mount Form Factor**

  9 outlet / 20 or 30 Amp includes IEC-C13 receptacles; L6-20P or L6-30P plug connection, 3.0m / 10 foot input power cord, and is 1U tall.
    - **MPH-NBR09NXXE30 Unit Cost $_____**
    - **MPH-NBR09NXXF30 Unit Cost $_____**

- **200-240VAC-Single Phase Input / Output – Vertical Form Factor**

27 or 21 + 6 outlet / 20 or 30 Amp includes twenty-seven IEC-C13 or twenty-one IEC-C13 plus six IEC-C19 receptacles; L6-20P or L6-30P plug connection, 3.0m / 10 foot input power cord, and is 1735mm / 68.25 in. long.

- **MPH-NBV27NXXE30 Unit Cost $_____**
- **MPH-NBV27NXXF30 Unit Cost $_____**
- **MPH-NBV27NOXF30 Unit Cost $_____**

- **120/208VAC-Three Phase Input / 208 & 120VAC Output – Vertical Form Factor**

27 or 21 + 6 outlet / 30 Amp includes twenty-seven IEC-C13 or twenty-one IEC-C13 plus six IEC-C19 receptacles; L21-30P plug connection, 3.0m / 10 foot input power cord, and is 1735mm / 68.25 in. long.

- **MPH-NBV27AXXH30 Unit Cost $_____**
- **MPH-NBV27ANXH30 Unit Cost $_____**
- **MPH-NBV27AMXH30 Unit Cost $_____**

Total Bid cost: (Totals #1 + #2 + #3): $_____

A Certified Check, Bank Check, or a Bid Bond in the amount of $ _____ is enclosed.

The Non-Collusion Affidavit is signed and attached _____

Bidder Proposal or Reference# _____

Special Instructions/exceptions: _____

_____

Are procurement cards (VISA) accepted for payment? YES or NO

If procurement cards are accepted, are there any restrictions or conditions? _____

_____

Are ACH Payments accepted? YES or NO

If ACH payments are accepted, are there any restrictions or conditions? _____

_____

_____ _____

Firm Name Authorized Signature

_____ _____

Address Print Name

_____ _____

City State Zip Phone Number Fax Number

_____

Date Email

ANTI-DISCRIMINATION CLAUSE

(Section 755, Pennsylvania School Code)

1. In accordance with the provisions of the Pennsylvania School Code, the contractor agrees:

a. That in the hiring of employees for the performance of work under this contract, or any subcontractor hereunder, no contractor, subcontractor, nor any person acting on behalf of such contractor of subcontractor, shall by reason of race, creed, color, discriminate against any citizen of the Commonwealth of Pennsylvania who is qualified and available to perform work to which the employment relates;

b. That no Contractor, subcontractor, or any person acting on behalf, shall in any manner discriminate against or intimidate any employee hired for performance of work under this contract on account of race, creed, or color;

c. That there may be deducted from the amount payable to the contractor under this contract, a penalty of five dollars ($5.00) for each person for each calendar day during which such person was discriminated against or intimidated, in violation of the provisions of the contract; and,

d. That this contract may be canceled or terminated by the school district, and all money due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this portion of the contract.

INSTRUCTIONS FOR NON-COLLUSION AFFIDAVIT

1. This Non-Collusion Affidavit is material to any contract awarded pursuant to this bid. According to the Pennsylvania Antibid-Rigging Act. 73 P.S. 1611 et seq.. governmental agencies may require Non-Collusion Affidavits to be submitted together with bids.

2. This Non-Collusion Affidavit must be executed by the member, officer or employee of the bidder who makes the final decision on prices and the amount quoted in the bid.

3. Bid rigging and other efforts to restraint competition, and the making of false sworn statements in connection with the submission of bids are unlawful and may be subject to criminal prosecution. The person who signs the affidavit should examine it carefully before signing and assure himself or herself that each statement is true and accurate, making diligent inquiry, as necessary, of all other persons employed by or associated with the bidder with responsibilities for the preparation, approval or submissions of the bid.

4. In the case of a bid submitted by a joint venture, each party to the venture must be identified in the bid documents, and an affidavit must be submitted separately on behalf of each party.

5. The term "complementary bid" as used in the Affidavit has the meaning commonly associated with that term in the bidding process, and includes the knowing submission of bids higher than the bid of another firm, any intentionally high or noncompetitive bid, and any other form of bid submitted for the purpose of giving a false appearance of competition.

6. Failure to file an Affidavit in compliance with these instructions will result in disqualification of the bid.

NON-COLLUSION AFFIDAVIT

Contract/Bid No. _____

State of _____ :

:s.s.

County of _____ :

I state that I am _____ of _____
(Title) (Name of Company)

and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers, I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication or agreement with any other contractor, bidder or potential bidder.

(2) Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor the approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before the bid opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid higher than this bid, or to submit an intentionally high or noncompetitive bid or other form of complementary bid.

(4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with or inducement from, any firm or person to submit a complementary or other noncompetitive bid.

(5) _____, its affiliates, subsidiaries,
(Name of my firm)
officers, directors and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as follows:

I state that _____ understands and acknowledges
(Name of my firm)
that the above representations are material and important, and will be relied on by the Centennial School District when recommending for award the contract(s) for which this bid is submitted, I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the Centennial School District of the true facts relating to the submission of bids for this contract.

_____
(Signature)

Sworn to and subscribed before me this _____ day of _____, 20____

_____
Notary Public

My commission expirers on _____